

# PATENT COOPERATION TREATY

# PCT


## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

REC'D 23 FEB 2006

PCT

Applicant's or agent's file reference 62844A	<b>FOR FURTHER ACTION</b>		See Form PCT/PEA/416
International application No. PCT/US2005/009767	International filing date (day/month/year) 24.03.2005	Priority date (day/month/year) 31.03.2004	
International Patent Classification (IPC) or national classification and IPC C07C45/63, C07C49/16, C07D301/26			
Applicant DOW GLOBAL TECHNOLOGIES INC.			
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 6 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> sent to the applicant and to the International Bureau) a total of sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>			
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>			
Date of submission of the demand  07.11.2005		Date of completion of this report  22.02.2006	
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465		Authorized Officer  Seufert, G  Telephone No. +49 89 2399-	



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**Box No. I Basis of the report**

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1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
  - ☐ publication of the international application (under Rule 12.4)
  - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements\*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

**Description, Pages**

1-10 as originally filed

**Claims, Numbers**

1-11 as originally filed

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
  - ☐ the claims, Nos.
  - ☐ the drawings, sheets/figs
  - ☐ the sequence listing (*specify*):
  - ☐ any table(s) related to sequence listing (*specify*):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages
  - ☐ the claims, Nos.
  - ☐ the drawings, sheets/figs
  - ☐ the sequence listing (*specify*):
  - ☐ any table(s) related to sequence listing (*specify*):

\* If item 4 applies, some or all of these sheets may be marked "superseded."

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**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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1. Statement

Novelty (N)	Yes: Claims	1-11
	No: Claims	
Inventive step (IS)	Yes: Claims	1-11
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-11
	No: Claims	

2. Citations and explanations (Rule 70.7):

**see separate sheet**

Reference is made to the following documents:

D1 US-A-4251467

**V. Reasoned statement with regard to novelty, inventive step or industrial applicability**

**Novelty**

The present application refers to a process for the preparation of 1,3-dichloroacetone comprising the steps of chlorinating acetone to form monochloroacetone followed by a disproportionating reaction of the monochloroacetone in the presence of a platinum catalyst, a chloride source, water and, optionally, a strong acid to produce acetone and the desired dichloroacetone (claim 1). The application further refers to the preparation of epichlorohydrin, comprising the aforementioned steps and in addition the steps of catalytically hydrogenating the 1,3-dichloroacetone to form 1,3-dichlorohydrin and cyclising the hydrin with a base to produce epichlorohydrin (claim 4).

None of the available documents discloses a process for the preparation of 1,3-dichloroacetone with all the features of claim 1, especially the disproportionation reaction of monochloroacetone has not been disclosed in the prior art. Claim 1 and 4 as well as the dependent claims 2-3 and 5-11 appear therefore to meet the requirement of Art. 33(2) PCT.

**Inventive step**

Document D1, which may be considered as the most relevant state of the art document, describes the preparation of 1,3-dichloroacetone by direct chlorination of acetone and/or monochloroacetone with chlorine in the presence of an iodine promoter. Apparently, this process has the disadvantage that the iodine promoters

are expensive and should therefore be recovered and recycled, which adds to the complexity of the process (see page 1 of the description).

The problem to be solved by the present invention may therefore be considered as providing an alternative process, which would not need complex recovering and recycling steps.

The problem has been solved by the process according to claim 1.

The first step of monochlorinating acetone is well known in the art (see application, page 2, lines 22-25). However, none of the available prior art documents describes the disproportionation reaction of the monochloroacetone or gives an indication that would motivate the person skilled in the art to use such a disproportionation reaction. The subject-matter of claims 1-3, therefore, appears to meet the requirement of Art. 33(3) PCT.

Claim 4 refers to a process for the preparation of epichlorohydrin comprising the reaction steps of claim 1. With claim 1 being considered as involving an inventive step, claim 4 and its dependent claims 5-11 are equally considered to meet the requirement of Art. 33(3) PCT.

#### **Industrial applicability**

There are no objections against the industrial applicability of the presently claimed processes.

#### **Further remarks:**

The statements on page 2, lines 1-4 and page 2, line 30 - page 3, line 1 are inconsistent with the claims. According to the claims a chloride source and water are compulsory features, while in the aforementioned statements they are described as optional. This inconsistency between the claims and the description leads to doubt concerning the matter

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(SEPARATE SHEET)**

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for which protection is sought, thereby rendering the claims unclear, Article 6 PCT.